# REPORT RESUMES

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THE EDUCATIONAL PROGRAM--COORDINATION AND DEVELOPMENT, IOWA COMMUNITY COLLEGE WORKSHOP (UNIVERSITY OF IOWA, IOWA CITY, JUNE 12-16, 1967).
IOWA UNIV., IOWA CITY

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DESCRIPTORS- *JUNIOR COLLEGES, *PROGRAM DEVELOPMENT, *PROGRAMED INSTRUCTION, *SYSTEMS APPROACH, *CONSULTANTS, CORE CURRICULUM, ELECTRONIC DATA PROCESSING, CONFERENCE REPORTS, GENERAL EDUCATION,

THIS WORKSHOP ON THE COORDINATION AND DEVELOPMENT OF THE EDUCATIONAL PROGRAM PRESENTED MATERIAL OF INTEREST TO PERSONNEL OF BOTH NEW AND ESTABLISHED COLLEGES. FOUR APPROACHES WERE DISCUSSED IN DETAIL--(1) THE USE OF A CORE PROGRAM TO PROVIDE A COMMON EXPERIENCE FOR ALL STUDENTS BEFORE THEY DECIDE BETWEEN AN OCCUPATIONAL COURSE OR HIGHER LEVEL PREPARATION, (2) THE EMPLOYMENT OF A CONSULTANT IN EARLY PLANNING STAGES AND THE RELATED USE OF SURVEYS IN THE DEVELOPMENT OF THE INSTRUCTIONAL PROGRAM, (3) AN EXAMINATION OF POSSIBLE USES OF ELECTRONIC DATA PROCESSING FOR ROUTINE DATA COLLECTION AND DISSEMINATION TASKS, AND (4) A SYSTEMS APPROACH TO THE INSTRUCTIONAL PROGRAM, WITH THE ANALYSIS OF THE COURSE TO DEFINE OBJECTIVES, THE FRAMING AND SEQUENCING OF THE INSTRUCTIONAL MODULES, AND THE EVALUATION OF THE LEARNER'S RESPONSE IN ACCORDANCE WITH THE SPECIFIED GOALS. IT WAS EMPHASIZED THAT IT IS THIS RESPONSE PRODUCED BY THE SYSTEM THAT IS IMPORTANT, NOT THE SYSTEM ITSELF. (HH)

ERIC

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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# IOWA COMMUNITY-JUNIOR COLLEGE WORKSHOP REPORT

## 1967

UNIVERSITY OF CALIF.
LOS ANGELES

OCT 23 1967

CLEARINGHOUSE FOR
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INFORMATION

**Sponsored**
**by**
**The University of Iowa**
**Iowa State Department of Public Instruction**
**Iowa Junior College Association**
**Midwest Community College Leadership Program**

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**Office of Community College Affairs**
**The University of Iowa**
**June 12-16, 1967**

JC 670 896

1967

# IOWA

# Community College Workshop

## "The Educational Program: Coordination and Development."

The University of Iowa
June 12-16, 1967

# ACKNOWLEDGEMENTS

The 1967 Iowa Community Junior College Workshop report salutes the 40th anniversary of the legislative recognition of two-year colleges and the nearly 50 years of actual operation. We wish to acknowledge the support of this annual workshop by the State Department of Public Instruction, the Iowa Junior College Association, and the Midwest Community College Leadership Program.

A special debt of gratitude is expressed to the community junior college personnel who served as presiding officers at the sessions and also those who served on panels. Thanks are extended also to the staff members of the three regions institutions and the State Department of Public Instruction for their contributions.

Iowa Community College Workshop
The University of Iowa
Iowa City, Iowa

June 12-16, 1967

Sponsored by: Iowa Junior College Association
Iowa State Department of Public Instruction
Midwest Community College Leadership Program
The University of Iowa

THEME: "THE EDUCATIONAL PROGRAM: COORDINATION AND DEVELOPMENT"

## PROGRAM

### Monday, June 12

PRESIDING: Vernon Pickett, Area 10 Community College

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| 9:00 - 9:30 | REGISTRATION | |
| 9:30 -10:00 | WELCOME BY SPONSORS: | Henry Witt, President, Iowa Junior College Association<br>Paul Johnston, Superintendent, Department of Public Instruction<br>Verle Stucker, Advisory Committee Member, Midwest Community College Leadership Progra<br>Howard Jones, Dean, College of Education, University of Iowa |
| 10:00-11:45 | KEYNOTE ADDRESS: | Professor Norman Harris, Professor of Technical Education, The Center for the Study of Higher Education, The University of Michigan |
| 11:45- 1:00 | LUNCH | |
| | PRESIDING | Richard Schultz, Eastern Iowa Community College |
| 1:00 - 2:00 | SUB-GROUP SESSIONS | IMPLICATIONS OF THE INTEGRATED PROGRAM |
| | Group A | Elizabeth Kerr, Director Health Occupations University of Iowa |
| | Group B | Harold Ellis, Director of the Technical Institute, Iowa State University |
| | Group C | Barry Reece, Business Education Institution, State College of Iowa |
| | Group D | Richard Holcomb, Director of Political Science, University of Iowa |
| 2:00 - 2:15 | COFFEE BREAK | |
| 2:15 - 3:45 | REACTION PANEL: | Professor Harris, University of Michigan<br>Clifford Beem, Director of Arts & Sciences<br>Ronald Anderson, Director of Voc-Tech Div.<br>Harold Ellis, Iowa State University |

## Tuesday, June 13

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| | PRESIDING: | Patrick Kelley, Southeastern Iowa College |
| 8:00 - 8:20 | "AN OVERVIEW OF THE UNIVERSITY CORE PROGRAM" | Samuel Becker, Director, University Television Center |
| 8:30 - 9:00 | NATURAL SCIENCE CORE | R. L. Cuany |
| 9:10 - 9:40 | SOCIAL SCIENCE CORE | Richard Wilmeth |
| 9:50 -10:20 | HISTORICAL AND CULTURAL STUDIES | George Forell |
| 10:20-10:50 | LITERATURE CORE | Richard-Lloyd Jones |
| 10:50-11:20 | RHETORIC PROGRAM | Cleo Martin |
| 11:20-12:00 | TRAVEL TO MUSCATINE | |
| 12:00- 2:30 | RIVER CRUISE AND LUNCH ABOARD THE KENT FEED CO. RIVERBOAT | |
| 3:00 - 4:00 | FEED AND FERTILIZER MARKETING TECHNOLOGY | A new program of the Eastern Iowa Community College, Muscatine Campus |

## Wednesday, June 14

| | | |
|---|---|---|
| | **PRESIDING:** | Wayne Gerken, Iowa Technical Institute |
| 9:00 -10:15 | "SURVEYS TO DETERMINE PROGRAM NEEDS" | Professor Norman Harris |
| 10:15-10:30 | COFFEE | |
| 10:30-11:45 | "THE OCCUPATIONAL EDUCATION PROJECT" | Dr. Lewis Fibel |
| 11:45- 1:00 | LUNCH | |
| | **PRESIDING:** | Orin C. Mann, Clarinda Community College |
| 1:00 - 2:30 | "THE CONSULTANTS ROLE IN PROGRAM DEVELOPMENT" | Professor Norman Harris |
| 2:30 - 2:45 | COFFEE | |
| 2:45 - 4:00 | FEDERAL, STATE, AND PROFESSIONAL AGENCIES ROLE IN PROGRAM DEVELOPMENT | Dr. Lewis Fibel |

## Thursday, June 15

| | | |
|---|---|---|
| | PRESIDING: | Dean John Goudy, Palmer Junior College |
| 9:00 -11:45 | INTRODUCTION TO THE SYSTEMS APPROACH TO EDUCATIONAL PLANNING | Dr. Robert Baker, Director<br>Litton Systems, Inc.<br>Educational Systems Division |
| 11:45- 1:00 | LUNCH | |
| 1:00 - 3:30 | SEMINAR SESSION: MEDIA SELECTION | Dr. Robert Baker |

## Friday, June 16

| | | |
|---|---|---|
| | PRESIDING: | Wayne Kyle, Western Iowa Technical Institute |
| 9:00- 11:45 | SEMINAR SESSION: SCHEDULING AND VALIDATION OF SYSTEMS APPROACH | Dr. Robert Baker |

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GUESTS:

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Dean Boyd - University of Iowa
Dean Spriesterbach - University of Iowa
Dr. Donald Cox - State Department of Public Instruction
Mr. Boyd Graeber - State Department of Public Instruction
Mr. David Bechtel - State Department of Public Instruction

# QUALITY AND DIVERSITY IN THE COMMUNITY JUNIOR COLLEGE*

by

Dr. Norman Harris
Center for the Study of Higher Education
University of Michigan
Ann Arbor, Michigan

I've been asked to discuss with you in this opening session of the conference some aspects of the Community College Program which relate to comprehensiveness, and I've entitled my remarks, "Quality and Diversity in the Community Junior College."

There is a great deal of confusion, I think, on this matter of comprehensiveness--exactly what it means. There is a great deal of confusion in terms of what we mean by quality and what we mean by diversity. There is a great deal of confusion about comprehensiveness in community colleges. I find it from the east coast to the west coast. We all use the term. We use it fluidly--it rols off the tongue, it sounds good, and we all have different scales of value I guess that we practice. And I'd like to spend the hour or hour and a half that we have this morning, I hope not adding to the confusion, but at least present some ideas I have on the topic and then these ideas may be spring boards for your discussion so that before the conference is over you may be able to clarify some of your thoughts and ideas about comprehensiveness and community college, about the role of general education, about the role of a core program, and the role of occupational education itself.

Just a little review to begin with. Most of these facts I imagine are known to almost all of you, but in case you hadn't noticed, this state is so busy here with your own development in Iowa. The public community college has you surrounded all over the United States. Every state now except Nevada has at least one and many of course have scores of community colleges. California, with 82, New York with 66, Florida with 29, Michigan - 27; all of these states can boast at the tremendous explosion almost of the community college movement. I've heard a great deal this morning and correspondence with your chairman has told me about the new developments in Iowa. Fifteen area districts with tremendous growth in this state; Illinois, as you know, has gotten off to a tremendous start in the last couple of years with its new developments. Nationally there are 565 public two-year colleges in operation and an additional 272 private colleges. These 837 colleges enrolled a little more than 1,465,000 students in 1966. Forecasting the future--not only is it dangerous, but I would predict and many others are predicting that by 1972 this nation will have more than a thousand two-year junior community colleges in operation and enrolling as many as 2½ million, with the 6 million which are enrolled this year in all higher education in the United States you get some little inkling of the impact which the two-year college is making on higher education in this country.

Let's review very hastily, if you will, just a few of the aspects of the philosophy of the public junior college. All these facts are, I'm sure, known to you so we'll go through them very rapidly. Most of the following statements would apply to most of the public junior colleges:

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* Presented at the Iowa Community College Workshop, University of Iowa June 12-16, 1967.

1. Tuition charges are nominal and even in some states free.
2. Admission standards for the college, that is, are not restricted. In most states the open-door policy holds in that any person who's a high school graduate or any person over 18 may be admitted to the college. Admission to certain courses and curriculum, of course, is not open to all.
3. A lower division of arts and sciences and so called transfer program is offered by almost all community junior colleges.
4. A program of one-year and two-year occupational education curriculum is offered by most two-year colleges for those students who expect to immediately enter the labor markets.
5. And this is of course one of the factors that we want to discuss at length today and in the ensuing days in this conference. Considerable emphasis is placed on general education by most community colleges, both in the college parallel program and in the career or occupationally oriented program.
6. The associate degree is awareded for the successful completion of two-years of prescribed courses, usually given at the completion of 62-64 credit hours.
7. Guidance and counseling service are the boast of most community junior colleges--in some cases a rather hollow boast. Guidance and counseling services ordinarily consist of a complete program of testing, of occupational information in counseling, educational advisement, program planning and placement. Many, but not all community colleges are also involved in a program of continuing education and in providing services to their community. Frequently, these programs involve more total head count than does the regular day program. Many community colleges with which I'm familiar in California and Michigan have twice as many persons enrolled in the late afternoon and evening programs than are enrolled in the regular day.

With regard to governance, there is a tremendous need for clarity, making it almost impossible to make a generalization. In many states, however, we can say that control is vested in a local board of trustees elected by the people of the junior college district. Financially, the student and the local districts and the state share the cost of unit annual operation and the local district and the state share in the cost of capital outlay. Now a few states have recently established, Minnesota being one, Virginia another and there's some other examples, state systems of community colleges with tight state control from the State house, with much larger funds of money coming from the state sources, with no local board of trustees as such, perhaps a local advisory committee, which is advisory only and has no authority. It will be interesting to watch these states and their development of the public community college over the next decade.

Finally, there is generally a commitment to opportunity for all the components of post high school education and training. I said generally, and in some cases one unfortunately observes that this commitment is one of lip service only. I hope that we can get right down to some of that very thorny issues involved in this commitment today and in the coming days of this conference. This very commitment implies the diversity which is the topic of my remarks this morning. But I hasten to say that this very commitment, despite the criticisms from our critics and from those who stand off and look at the public community college, in spite of what those critics have to say, this diversity does not mean and does not imply and should not result in any diminution of quality whatever and that balance between quality and diversity is the real meat of the remarks that I want to make to you this morning.

A little bit about occupational education first, and we will talk a little later about transfer or general studies in the liberal arts program.

If the impact of technology teaches us anything at all and its been with us now for the past ten or fifteen years, it teaches us that some cherished beliefs in our higher education are not only old-fashioned, but they are becoming utterly false. The idea that liberal arts education is for the few, for the cultured and ruling elite and that practical education, mechanical education, and occupational education is for those who could work and be ruled is dead, at least in the USA. The surge of technology has brought about a situation in which almost all work has a great deal of cognitive content. Non-cognitive work is increasingly being accomplished by machine. A vice-president of the Ford motor company in a very recent pronouncement stipulated that a person with Ford, and this could apply to a person working with any major corporation today, needs at least 12 years of education today to compete with a machine; it all means that he must have more than 12 years of education. That old dichotomy between the liberal arts and the academic education on the one hand and practical arts and occupational education on the other, is now meaningless, if it ever really had any meaning. After a thousand years we must finally come to the realization that higher education is not help for the few, but is a driving force for the economic and cultural development of the nation. In modern industrialized societies, rich and poor alike work and those with the greatest amount of education are quite likely to work harder. In this connection we can predict a complete reversal of Aristotle's famous statement about education for leisure and turn this idea completely around to our time by noting that the only sure guarantee of leisure today is a lack of education.

As a result of the technological revolution, a complete new spectrum of occupations has developed in between the professional on the one hand, and the trades and crafts and the semi-skilled and unskilled on the other. These new semi-professional jobs have increased by the hundreds, by the thousands in the past three decades, until today we find that such segments of the population as manufacturing and that kind of industry, the whole tremendous agricultural industry of this nation, the whole field of business office and sales and marketing, health and medicine and the rapidly growing field of private and public services, all these major segments of the total economy of the nation are almost as dependent today upon the semi-professional, on the technical worker as they are on the professional workers themselves. In the field of health and medicine, for example, the national president of the AMA speaking recently in Chicago on the topic of Technical Occupations in the health field made the statement that at the present time semi-professional persons had a ratio of about 7 to 1 to professional persons throughout the health field. And if you visit a major hospital it becomes immediately apparent. The doctor and the nurse are and have been the key persons in the health fields, except that their work, without the aid of all the technicians, and you could name 35 or 40 kinds of semi-professional-technicals that contribute toward the operation of a major hospital, without the back-stopping ability of these semi-professional technicians who work with the doctor and the nurse, would perhaps not grind to a stand-still, but it would certainly be powerless to act.

The term "middle-level-manpower" has been used to describe this tremendous spectrum of occupations which lies between professional-managerial on the one hand and trades and crafts on the other. At one end of the middle-man-power spectrum, jobs are reasonably close to the professional; for instance, the research technician or the engineering technician or the associate degree nurse. These jobs have a very high cognitive to manipulative ratio. That is, the ratio of the amount of cognitive knowledge to perform the job to the amount of manipulatory skill to perform the job. The cognitive to manipulative ratio with these upper-level semi-professional jobs is relatively high. At the other end of the spectrum of middle-man-power jobs are many jobs that are closely related -- the highly skilled trades and crafts, for example, the television service technicians, and the automotive technicians where the cognitive manipulative ratio is reversed. It can be said that semi-professional technical jobs more and more require post-high school preparation of one, two or three years, but that for most of these jobs a B.A. degree is not required. Now this is not to say that occasionally a baccalaureate person does not perform technical work. They do. Neither is it to say that occasionally high school graduates without any further education do not occasionally high school graduates without any further education do not occasionally hold technical jobs. They do. But, by and large, today and increasingly in the future, this whole spectrum of middle-man-power jobs is going to have to be filled by persons who have only two or three years of post-high school education.

Let's deal with definitions at this point. I know there isn't complete agreement on the definitions that I am going to give, but let me talk about six or seven definitions which are beginning to be accepted in many quarters.

With regard to this total field of occupational education, I'll start with the term itself. Occupational education is a generic term. It is the overall umbrella term to describe any and all education for any purposes-- all utilitarian purposes. All purposes, all programs, designed to prepare for careers of any kind, at any age. This term then would include professional programs in universities and and graduate schools all the way to job training with only two weeks duration in a class. Occupational education then is the umbrella term that covers everything.

Professional education. This term is applied to standard education and training which takes place usually in the graduate professional schools-- medical schools, law schools, engineering schools are good examples of this kind of education. Pre-professional education is that kind of grouping of courses and curriculums many of which are offered in the community junior colleges which lead to advanced study in the profession.

Semi-professional education. This is a term that as yet is not completely accepted. Semi- carries certain connotations which are not entirely desirable; for one thing, it tends to mean half and half a professional person is not what we want to get across here. Quasi- might be a better prefix, but it has not gained any great acceptance either. So until a better term is invented we will continue to use semi-professional. It is usually a two or three year curriculum almost entirely less than baccalaureate degree length, which leads to employment in areas such as science research technician, medical lab technician, legal secretary, the surveyor, the engineering laboratory technician, etc. The cognitive to manipulative ratio in the semi-professional education programs is relatively high. Semi-professional programs of education, in my opinion at least, must involve a core of general education. Semi-professional workers work very closely with professional workers and consequently, to emphasize training without emphasizing education is a mistake.

Technical education. This one is really tough to define. It is a popular term and may have lost any real meaning for us. It has become so popularized, that high schools and vocational schools speak glibly of their technical education program and many propriatary schools will advertise on the radio and over television. Some of them of questionable quality, some very good. They importune the gullible public to enroll in their 16-week or their 48-week or their 3-week sped-up, high-pressure course which will prepare the graduate for the very lucrative fields of opportunities awaiting him as "a technician." Some educators in recent years have used the term to apply to almost all occupational education. I think this is a mistake. I find many community college presidents and deans speaking about a technical program when they really offer occupational programs. The term technician has a very specific meaning and I think that technical education ought to have a certain delimitation in its meaning. I would offer that technical education consists of those post-high school programs of education which had a strong content in the applied sciences, in engineering related courses, in mathematics, and in the mechanical arts. Now for the mechanical arts, if you like, in the field of medicine and health, where we do have the PKD technician and the medical lab technician and some other technicians, you could substitute life sciences for mechanical art, but again you get back to the sciences and math.

Trade and industrial education. This term has almost dropped out of the lexicon in the last four or five years because those schools who offered it have latched on to the term technical as being preferred. It seems to carry an aura of greater respectibility. I submit that there isn't anything at all wrong with trade and industrial education; if you have a program that prepares persons for entry into the trade, call it that.

Business education. This is a term that is still very much with us and not so much misunderstood. Incidentally, these programs probably enroll more students in community colleges than any other and in some more than all of the other occupational fields combined.

Health occupations education. A relatively new field for community colleges. The associate degree nurse program is now some ten years old, but in recent years there has been a whole new area of health technology coming into the community college. Training for such jobs as associate degree nurse, and practical nurse, medical lab technician, psychiatric technician, dental assistant, medical office assistant, inhalation therapy assistant, surgical technicians, etc. These are moving very rapidly to a position of importance in the community colleges all over the U.S.

A field that we've all been talking about the last several years, but I haven't done an awful lot with it yet, but I think we must, is the field of the service occupations.

Kenneth Galbraith, in The Affluent Society, emphasized that we are moving more and more from a productive labor force to a labor force involved in the service occupations. That indeed as of about 1962, more than half of the service force in this country became engaged, not in producing things but in producing services. This is true in society and yet our educational program does not reflect it. There are many difficulties in planning programs of education for the service occupations, not the least of which is that very few students want to take them. But the facts are that more than half the labor force in the U.S. is engaged in the service occupations. Training is essential in those occupations, but it becomes very difficult for a community college to have a full-blown, well-organized program in the service occupations, because students don't flock to those kinds of programs. Examples of such programs are law enforcement, fire service, conservation technicians, environmental controls sanitation technicians. In the private sector of the economy we have hotel and restaurant management and many other kinds of service occupations.

Agriculture education. This kind of education has experienced some decline in the last 10 or 15 years, particularly in terms of the numbers enrolled in agriculture programs in high schools. I don't really know that this is true in Iowa, but it is true in many states where farming has moved from a family to a corporate operation. There has been less emphasis on agricultural education as such and in many schools the program has died out. But as the actual plants of farming on the farm have been decreasing, the full occupations connections in agriculture technoloty have been increasing and many community colleges are operating programs in these fields which are related to agriculture but are not related to the actual ownership and management of a farm.

From all sources including community colleges, technical institutes, branches of the University, area vocational-technical schools and military schools, we are producing only on the order of 40-45 thousand trained technicians per year and consequently the technician gap gets wider and wider as the years go on. If we add to that all of the kinds of jobs in the business fields and in the public services and guidance services field, in the allied health fields, in agriculture and many other segments of American industry which need this new level kind of employee, we can easily come up with a figure well over 10 million persons that are now working in middle-man-power occupations.

One of the factors that exacerbates the shortage of technicians is that we also have a shortage of professional persons in these fields, and some of the professional persons are saying, "I can't keep up with my work. If I could just get a few more technicians, back-up personnel, it would enable me to multiply my own efforts by 1.2 or 1.6." And he starts looking around for the technicians and they aren't there to get.

Well, where are the millions of people going to come from who are going to be required to fill the technicians gap, be educated and trained? In my opinion the community-junior college will have to take on the majority of this job. Private technical institutes in this country have been, in the past, and they are still making a very worthy contribution. Many of these institutions are not growing in number at all. Twenty years ago there were about 38 such institutions and today I think there are 36 of these institutions. The area vocational-technical school which are is coming into being is aimed more at the high school level and at retraining and at some post-high school kinds of programs that we're beginning to call the industrial-technician level, but most certainly not at the program with a high cognitive-to-manipulative ratio, that I've been talking about and it seems to me that these programs and this tremendous gap, if it is to be filled at all, is going to have to be filled by the community junior college.

Without a doubt I think I would stand on this and if I'm around in 1975 we can get together and check up on it; but I strongly believe that by 1975 one person in every four in the work force of the U.S. will be engaged in the kinds of jobs that we've been talking about.

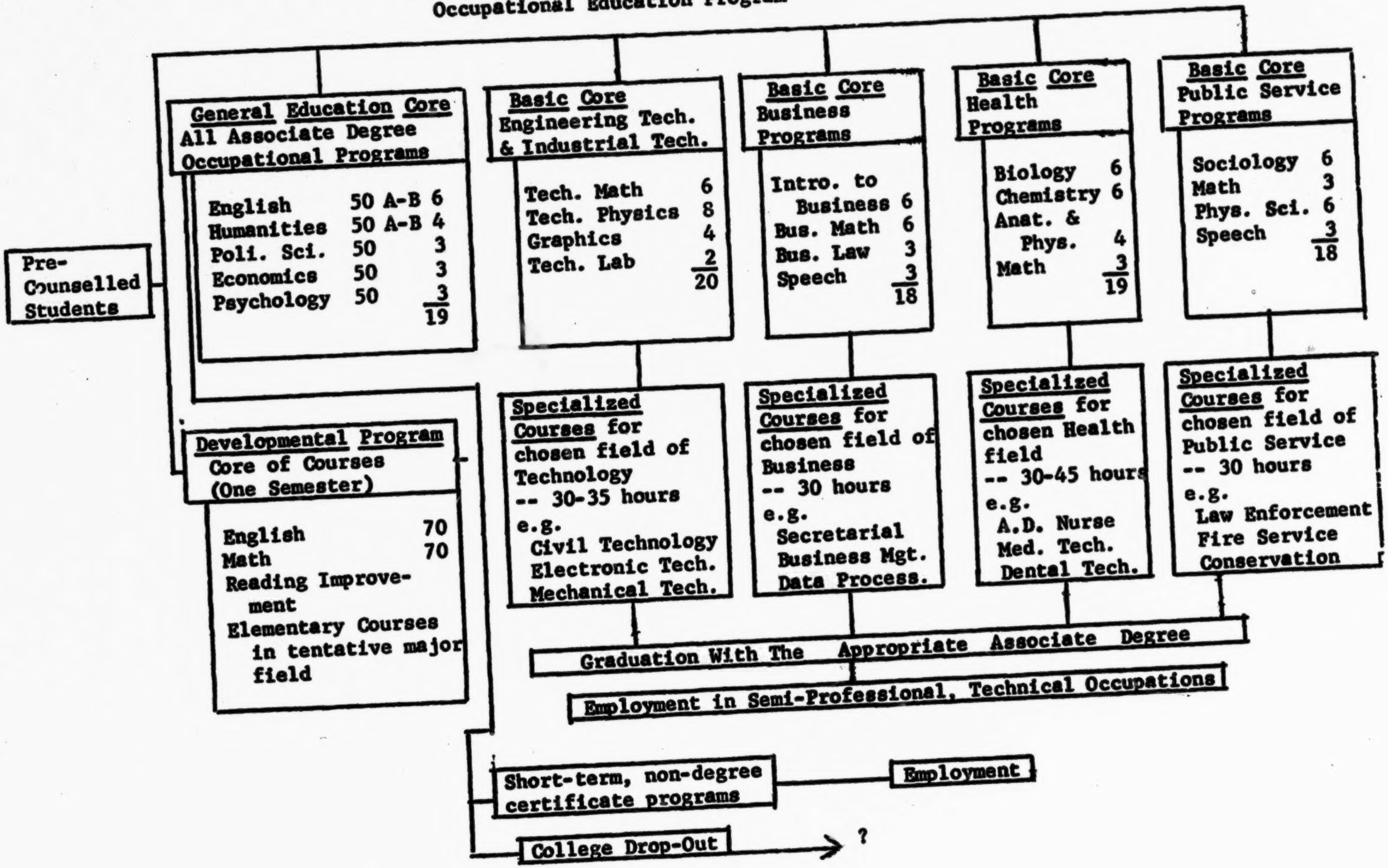
I want to talk a little bit about the kinds of programs and the kinds of content and how we can work out some kind of a core curriculum involving general education, involving the direct kind of highly specialized technical education, and the right kind and level of math, science and supporting courses.

I'd like to propose a model for the associate degree occupational program which would include these three kinds of content and I'll repeal them again. The three kinds of content are: first, a floor of content for specialized occupational fields itself. You do have to get this person ready to move in and hold down a job--he must be confident. The second kind of content I would identify as a basic theory and supporting subject core, which for the engineering technician would be in the fields of math, science, and engineering. And the third kind of content is a general education core which would provide a foundation for intellectual, social, and cultural growth. It broadens the educational base in the student and assists them in adapting to changing jobs and changing economic requirements as they move on into their 30 or 40 year working life.

The community college is hopefully receiving pre-counselled students. If the student has not been counseled during the summer or indeed when they were seniors in high school then you're going to set up a week long or even longer period of counseling or consultation so that before the student shows up and is ready to enter courses he has had a complete analysis of his ability, his high school grades, test scores, so that both he and the counselor have some realistic appraisal of his interests and abilities and can place him in the kind of course or curriculum where he will meet success.

I'd like to take the case of the high school student who seems not well enough prepared, his high school grades, test scores, etc., indicate that he is not really ready to enter one of the associate degree occupational curriculums. That student, then, should have available to him in the college a developmental program consisting of a core of courses perhaps lasting only one semester in which the community college attempts to erase gaps, difficulties, and the inabilities in this student no matter where he got them. It isn't sufficient to blame the high school or any other school. Here he is. He's your student now. He isn't their student any more. What are you going to do with him? Development then of a core of courses could be called an opportunity program. I would avoid the word remedial if I were you because of its negative connotation. In it the student would get a semester of English, a semester of math, a reading improvement program, preferably a reading improvement clinic, and then one elementary course in his chosen field of interest. The reason for this latter is motivation. If you say to this student, "Well, yes, I think you can be an automotive technician, but you can't start now. We have to put you through a whole semester of academic work first." This is hardly motivating to him. So if we can provide a number of courses at a relatively low requirement of ability so that the student could get started in his chosen field and at the same time continue to develop his skill in three basic areas: English, math and reading. This then may be the salvaging of many many students that come through the open door. Obviously not all of these students succeed. They can join the main stream in success or get a short term degree certificate or drop-out.

# Suggested Core Curriculum Plan
# Community College Associate Degree
# Occupational Education Program


Pre-Counselled Students
General Education Core
All Associate Degree Occupational Programs
English 50 A-B 6
Humanities 50 A-B 4
Poli. Sci. 50 3
Economics 50 3
Psychology 50 3
19
Basic Core
Engineering Tech. & Industrial Tech.
Tech. Math 6
Tech. Physics 8
Graphics 4
Tech. Lab 2
20
Basic Core
Business Programs
Intro. to Business 6
Bus. Math 6
Bus. Law 3
Speech 3
18
Basic Core
Health Programs
Biology 6
Chemistry 6
Anat. & Phys. 4
Math 3
19
Basic Core
Public Service Programs
Sociology 6
Math 3
Phys. Sci. 6
Speech 3
18
Developmental Program
Core of Courses
(One Semester)
English 70
Math 70
Reading Improvement
Elementary Courses in tentative major field
Specialized Courses for chosen field of Technology
-- 30-35 hours
e.g.
Civil Technology
Electronic Tech.
Mechanical Tech.
Specialized Courses for chosen field of Business
-- 30 hours
e.g.
Secretarial
Business Mgt.
Data Process.
Specialized Courses for chosen Health field
-- 30-45 hours
e.g.
A.D. Nurse
Med. Tech.
Dental Tech.
Specialized Courses for chosen field of Public Service
-- 30 hours
e.g.
Law Enforcement
Fire Service
Conservation
Graduation With The Appropriate Associate Degree
Employment in Semi-Professional, Technical Occupations
Short-term, non-degree certificate programs
Employment
College Drop-Out
?

# THE OCCUPATIONAL EDUCATION PROJECT*

by

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I would like to share with you some miscellaneous thoughts that I have had as I was involved with this project for a little over a year. We are talking most specifically, though not exclusively, about the occupational education role of community colleges. I think it is important that we bear in mind that this is only one of many roles that a community college can have. There are many, including transfer education, remedial education, special education, work with disadvantaged groups, community services, and you can make this a rather long list. I think this is very important - to remember that occupational education is only one of the processes of the total community college program. Occupational education has evolved from presures from a number of sources. The technology dimension and the man-power dimension is one that is very obvious in these days of computers and these days of missiles going to the moon and Venus - it is very easy to see the societal and student pressures that have equal impact on the colleges and on the establishment of occupational education programs. Certainly the approach that Professor Harris has taken and the surveys that he has been concerned with and the voluminous material that he attempts to accumulate from students, from high school graduates, from parents of students, etc. is most commendatory and most useful. One must be frank in saying, though, that many surveys by other individuals concentrate almost exclusively on the industry needs and pay no attention to the needs of students. And there is most frequently a lack of congruence between what industry needs and what students say they want to study. It seems to me that this is an important area of research and study. It is epitomized to me by the fact that there are many good business programs in community colleges around the country. And those of us in community colleges seem to think that this is the sole answer to the programs in the business area. In fact, however, there are many private or profit business schools and colleges that do extremely well in terms of attracting students to them. I think that one study for the sociologist is why the student who has the choice would choose the private business school over the public community college. What is it in the community college that is not attractive to these students and is attractive in the private business school. I suspect that this may have relation to the program in agri-business that we examined in Muscatine. The motivation of students, their identification, at least with some students, with a particular career and their desire not to be bothered with a general education, not to be concerned with the things that they don't see the immediate application of. At the same time I think that we must always keep in mind during our discussions of occupational education in the community college that there are a large number of other institutions of various sorts that are making substantial and important contributions to occupational education. I would hope that the community junior college never tries to be all things to all people. I don't think that is possible. There are excellent occupational programs in the high schools. There are excellent occupational programs in area vocational schools and technical institutes, I think you would be surprised at the number of associate degree level occupational programs that are offered by four-year colleges and universities. There are almost as many four-year colleges offering associate degree programs, over 300 of them, enrollment though is greater in the two-year institutions.

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* Presented at the Iowa Community College Workshop, University of Iowa, June 12-16, 1967.

Private schools, including correspondence schools, are making important contributions to this field and more have extensive occupational programs sponsored by such federal agencies as the Office of Economic Opportunity, Man-Power Development and Training, and the Department of Defense. Lastly, the contribution of industry to training programs at a high level of technical learning is very substantial. You have probably all read the book, Factories with Classrooms; you should. The number of students in industry training programs is far greater than the number of students in community colleges. With this background, let me give you some of my thoughts on occupational education. I have a self-analysis of problems that must be solved, the answers to some questions will have to be arrived at before occupational programs can be established. I think that there are three dimensions to an occupational education program that require decision. These are, in conventional administration terms, the dimensions of level or height, breadth or depth, and length or time. I think that we have been speaking mostly about the semi-professional level of occupations. This is the level that they could be called that of a technician in employment. This is characterized most easily in the health field where we rather readily recognize the semi-professional level of the nurse, the medical laboratory assistant, the X-ray technician and many others. Kinsinger identified 40 of these semi-professional positions that are the low lot to the physicians, scientists, and dentists , but are above the level of the skilled craft labor. This concept has gradually been extended to other fields of employment, perhaps historically next to the engineering field where the engineering technician with the designation civil, mechanical, electrical, etc., corresponding to the engineering field itself, has been reasonably well defined for the past fifteen years. Perhaps what is most interesting in this development of semi-professional man-power is probably the extension of this concept beyond the older fields of health and engineering and into a host of new fields. I suggest to you this morning that we are discovering (I'm not sure that we discovered it, but at least we are becoming aware of) the immersion of a similar group of occupations in fields related to the public service. There is a most interesting report by the President's Commission on Crime and Delinquency which suggest special positions in the police and law enforcement, correction, etc. We have had conversations with people responsible for urban planning who say the re-design of the field of urban planning with the spinning off of certain of the possibilities that previously were the prerogative of the professional into a new cluster of jobs that are semi-professional in character and can generally be encompassed by the fact that they require about two years of post-secondary education. Many other fields are also evolving in this way. One that I find very interesting at the moment is the whole field of environmental control and management--water polution control, air polution control, solid waste control, the whole spectrum. There are certainly man-power needs and there are people who are talking about restructuring this occupational area to maximize the use of professionals by providing semi-professionals to assist them. A second field that is new and emerging and has not yet been well characterized, is that of marine technology or oceanography, where both the industrial applications as well as research exist. This area seems to suggest the desirability of evolving a new and different kind of man-power organization. Occupational education in the community college may involve other levels than the semi-professional level--there is nothing so sacred about this, however, I think that the main thrust of occupational education at the junior college has been at this level. This, then, is one thing that must be set before designing a program--you have to decide what the outcomes will be in terms of the level to which you are reaching. You can see this, I think, most specifically in, say the mathematical level of an engineering or science program. Here is a program that is going to be basically algebra and trigonometry based or calculus based and by the setting of that level you have set one basic dimension of the program.

The second dimension is the breadth--how wide is the program going to be, what is the job or cluster of jobs that are going to be encompassed by it. I spoke this morning in describing our own activities, of red areas of technical occupation. Probably in none of these is it possible to have a program that would encompass meaningfully all of them. An engineering technician for example is almost a meaningless term. One has to further subdivide this; one has to possibly arrive at curriculum in what we call our conventional two-year program. And the division here has been the one that would seem most obvious, at least it is the conventional one, of dividing the semi-professional level of occupations, corresponding the division of the professional one, and the careers and curriculums that have evolved are essentially those of civil engineering technology, mechanical engineering technology, etc. But they basically follow the division of the engineering fields. This is less true in other areas. This is not at all true as far as I can see in the health fields where the definition of breadth of the curriculum is rather specific and is related, as of course it should be, to specific job objectives rather than to a cluster. Nevertheless, in the design of new programs, one does have to make a decision. One can follow decisions made by others, and say we are going to have a medical secretary program, or one can break new ground on occasion and arrive at decisions by themselves. I had a discussion on a specific field with some people recently which I thought was interesting. We were talking about programs in the general medical field and the group quickly decided that the conventional way, that if you have a medical secretary or a dental secretary or assistant and these are two separate and distinct things and there is no possibility of combining them into one. I broached the question that it seemed to me, at least, that in the practice of medicine, there was as much difference between the practice of the psychiatrist and the practice of the traumatic medicine practitioner, as there was between medicine as a whole and dentistry as a whole. And I could get nobody at all to buy this. It seemed obvious to me because I had nothing to do with it and yet to the people well entrenched in the field the conventional distinctions, the conventional derivations of breadth were over-powering. I think that there are certain criteria which can be used in defining breadth. I think that breadth of a program should be narrow enough so that the student has a reasonable opportunity of finding employment in that field. Reasonable is a good word--you can define it or twist it any-way you want. On the other hand, I think a program should be broad enough so that there is a reasonable possibility for mobility on the part of the student if the economy of a region, or technilogical change, or his own interest and motivation suggest some mobility. Within these two broad criteria, you still get down to specific problems, but I think they do point some overall limits.

Given, now, a decision on the desired level or height or the occupational program, the desired breadth, the depth, one presumably would arrive at how long it would take to prepare students, starting with high school graduation and certain entrance requirements. It would be very interesting to me if someone would do this; I know of no one who has followed this analysis. It seems to me that the tail is wagging the dog--we started out with the decision that the program must be two years in length, and then we start chopping off in terms of how far we're going to go and how wide it is going to be to fit into this particular time period. I think that there are great possibilities when people have the imagination and courage to deal with them, to destroy the holiness of the two-year program and to design programs of any degree of length necessary in order to arrive at the ideal dimensions of breadth and heighth. If any of you want to experiment in this field, I would be most interested to hear about it.

I want to only say a few more things that may be of interest to you. We have been talking some about general education, its relationship to technical or vocational education and I can suggest a couple of additional points to those which have been brought out before. One is this, that I think there are great opportunities for the people who consider themselves to be part of the force of general education to develop occupational programs and these opportunities when presented to some of these general education people have proven to be rather exciting for them. Some of these I've hinted at before, but let me make a few of them more specific. There are, it seems to me, many new semi-professional careers that can be developed in the field of communication. I speak of this now not from the field of mechanical or electrical point of view, but from the language point of view. I think that if the English faculty were alerted to the possibility of the developing semi-professional careers in journalism, in radio and TV and advertising and the other media, they would be astonished at the potential and challenged by the job to be done. I've had some experiences, not in this field, but in the social sciences. By bringing to the attentio of some of our general education faculty in the social sciences the manpower requirements in the applied social sciences, for example in psychiatric aids for mental hospitals and social work assistants who work with the social worker or child care assistants to work in institutions that care for children of various sorts. They have been quite stimulated by this and have become part now of the total field of education which must necessarily have occupational aspects. The fact of the matter, as I see it, is that really the distinction between general education and occupational education is meaningless. My field is chemistry--I've taught chemistry for 14-15 years; I'm sure that I never held one single class in which some of the materials that I taught were not vocational-technical. Some students in the class and some of the material would have relevance to their general education. I can't imagine a single course nor even a single session where some of the things that are discussed, taught, and learned do not have general education application for some of the students and occupational education aspects for others. And I don't think that you can identify at the moment which students are which; I think this is something that will develop later.

Now to a topic that has been hinted at during these meetings here. I have noticed lately an increasing growth of two forces that I think have potential impact, certainly on occupational education in the junior colleges and perhaps greater than that. These are the forces with impact towards standardization, control, development of what is called quality and similar forces. They come from two general sources that are quite different; one is the professional group and the other is the state agency group. I don't think I can report this without exhibiting my own prejudices; I will try, however, if I can. There is, as I said this morning, an increasingly great interest expressed on the part of large numbers and diverse groups of professional associations in the development of programs where encouragement for the progressive programs for the training of semi-professionals. And most frequently they suggest the community college as the most likely institution to play a major role in this development. Again citing example that I've had recently, the American Institute of Architects has established a committee on the training of architectural technicians. The American Chemical Society has several committees that are concerned with the training of chemical technicians. The American Society of Civil Engineering has a similar committee, and there are many more than this.

I think there is real and sincere interest on the part of these groups for recognition of the fact that to maximize the use of the professionals, the professionals who do the work for which they are training, the emergence of a qualified group of semi-professionals can be a strong force in this direction. What follows almost inevitably after the expression of interest and the drafting of a committee to study it, there is the recommendation of a curriculum to train such technicians. This is the qualification of the fact that they are needed to teach courses to these technicians. These are, in fact, the items of equipment that you should have in your laboratory; these are the facilities that you should build for housing such a program;and finally, in order to insure that all the qualities are met, we will establish an accrediting procedure and we will put our seal of approval on those institutions that meet these standards. The second set of agencies that are moving in quite similar directions are the state agencies. Both the state vocational agencies who get their direction from the Vocational Education Act and the State Departments of Education which are concerned in some states with teacher certification at the junior college level and for curriculum approval in certain other states. They have now emerged from their several states and have so-called minimum standards for curricula in technical education for those states. Other agencies which sometime have an influence here are those state agencies that are concerned with the licensing of individuals; there the licensing sometimes refers also to a curricular pattern or curricular structure. Specifically, for example, in some states a specific license is required for dental hygiene. This seems to be extending to other occupations. New York was the first state recently to require the licensing of X-ray technicians. Morticians are licensed and, as you know, in many states, so are T.V. repairmen, barbers, and so forth. The licensing frequently has an educational side to it; that is, it may require as part of the admission to the licensing examination the completion of certain educational requirements at an approved institution--another agency getting into the act. I have compiled a fairly large list of organizations and agencies of one sort or another who are setting or are attempting to set standards. I would suggest to you that there are certainly values to standards. Values are reasonable if they are flexible; they set a minimum floor for quality; they can do much to insure good programs. I think that standards are also valuable at an institution and within a particular department, certainly as the considered judgment of people who should know and can be brought as very useful weapons against, for example, unreasonable budget cuts, against unreasonable work loads, or unreasonable criteria than an administration might wish to establish. With regard to those standards which have been promulgated by the professional groups, I think these have very great value in the involvement of the professional who will be working as a semi-professional in the development of educational programs. I think, however, that there are a series of objections to these standards which may or may not pertain, depending on the way in which they are implemented. Frequently, of course, standards can be unreasonable or inflexible. There may frequently be conflict among differing sets of standards. Certainly, as more and more agencies get into this business, the possibility becomes very great. In the specific case of accreditation and multiple accreditation as substantial disadvantage, is the cost in terms of time and money that is involved in the multiple examinations that programs have for a single institution. I think that most inportant in this list is the fact that the imposition of external standards tends to deprive an institution of its autonomy and tends to deprive the faculty of that institution of their motivation towards innovation, creation, new ideas, new approaches. If I was sure that we had reached the final word in any occupational program, I don't think that I would object too much to the imposing of standards to meet that. I don't take this position. I think that neither in terms of method, nor in terms of specific curricular objectives have we gotten to the point that we can be positive that this is the last word. I think, in any event, that standards should be stated in terms of performance criteria, rather than in terms of pre-performance criteria--pre-requisites; this would be a much more reasonable approach. Let me give you an example. It is, of course, much simpler in setting standards for teacher hiring to say that a teacher should have completed such and such courses, have such and such degrees, have so many years of experience in this or that occupation. What we really want to do, presumably however, is to insure that there is a minumum standard of performance on the part of the teachers. If we were able to establish the criteria by which we could measure teacher performance with a reasonable degree of success, I think we would be on much sager ground. I appreciate the difficulties of this. One last word here and that is that I don't think that there is necessarily the relationship between the protection of the public good which is the usual argument for licensure of individuals that are concerned with public welfare and safety, and standards for institutions. Although this is a juncture that is frequently made, I don't think that it is necessarily valid and I think that we can, if we again have valid standards for measuring the performance or performance potential of individuals licensed to practice nursing, to fix your plumbing, to repair your T.V. set, without necessarily turning this into specific educational requirements. Again here I hope that some of you would have the motivation to try some experiments in this field and I would be most interested to hear how you make out.

Lastly, my thoughts in this field are that what is really needed is a great deal of research on the part of the university and evaluation on the part of the institution of the community college. I'm afraid that in setting educational budgets in two-year colleges we rarely put the funds into evaluation as we should. The amount of data that is coming back that provides feed-back and feed-in to our education processes from the results of them are much too slim. I would hope that we could reach agreement that a minimum of 2-4% of the educational budget at community colleges could be plowed into evaluation and that this evaluation be a feed-back into our educational fund.

## THE CONSULTANTS ROLE IN PROGRAM DEVELOPMENT*

### Professor Norman Harris

### Second Presentation

I mentioned earlier that one of the roles of the consultant is a feasibility study and I gave you an example of one such study--the Peoria st study. Most of you are already in existing community colleges or community college districts and so are probably not concerned with study testing the feasibility of establishing a community college, so I'll pass over this very briefly. Such a consultant has as his principle role on his first visit the job of working himself out of a job, because he can't do this study from long-distance he must rely on local people to do all the ferreting out of the information, the necessary tabular data, feeling the pulse of the public, the legal implications of establishing a colleges, and train them to do most of the work and he must come back from time to time to advise them as the study proceeds. Several one or two day visits may be necessary and, of course, he has rather heavy involvement when it comes time to write the final recommendations of the feasibility study.

Related to this is another role of consultants in the preparation of state master plans--this was an activity that began about ten years ago, reached a peak about two years ago, and is now beginning to taper off. The reason it is tapering off is that most of the states now have master plans. There are only 50 states and most of them now have some kind of a master plan in effect, or enabling legislation has been passed and is being implemented by guidelines set forth in the standards and policy regulation manuals of the sort that I showed you from Pennsylvania. I presume that one is already published or is under preparation for the state of Iowa.

The role of the consultant in state master planning consists usually of meeting with legislators and key politicians and state leaders in many other fields, with presidents, deans, etc. of the state universities and four year colleges to get their attitudes toward the community college. I can remember the very bitter and acrimonious meetings with the president of Penn State when we did the study in Pennsylvania, but you at least want to know who your enemies and friends are before you start. Frequently you'll prepare model legislation and I should call attention to the fact that the American Association has several documents relating to model legislation, guidelines for legal implications for community colleges. I don't know of any state that has actually copied the AAJC document paragraph by paragraphy but certainly the AAJC document has been very helpful to many states in preparing enabling legislation and follow-up legislation for community colleges and for operating. The consultant frequently assists in the strategy planning for getting the legislation enacted and it is just politics--you have to be a strategist and when it comes down to the final clash you have to maneuver the legislation onto the floor, getting it onto the floor at the right time, it is very interesting, and sometimes you get to have quite a part.

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* Presented at the Iowa Community College Workshop, University of Iowa, June 12-16, 1967.

We mentioned curriculum development, and I'll just touch on that, since we've been talking about it most of the time. I do want to say one or two words however, then we'll come back to what we've been discussing so much--the gneral education content. The boast of junior colleges is that good teaching goes on here. If we expect that to be believed and we believe it ourselves we have to make an effort to make sure that it is true. Make sure that the community college faculty member is really devoting his greatest efforts to teaching students--that teaching and learning are really taken seriously within the community college. The consultant can assist here by helping in program development, by conducting faculty workshops, working with faculty and staff and student groups, he can help the faculty and staff make decisions on such matters as the breadth, the level, and sequence. If you set up a course program without attention to the proper sequencing of the courses involved it is a sad mistake. It involves taking what you need from this course and that course and wrapping it up into a suitable course for the program you are working with.

We have all talked for the last few days and I still don't sense a great deal of agreement on this philosophy of general education vs. occupational skill training, but I think maybe we have raised enough issues to send you home to think about it. So that you will come up with your own decisions and your own philosophy rather than taking some sort of package deal. We've proved, for example, that so many credit hours of liberal arts education is going to result in this or that or the other kind of objection from the citizens. As much as I favor general education I'm afraid that I cannot offer you any specific group that will result in this and this kind of performance as a father, as a family man, as a citizen, as a leader in the community.

Consultants are frequently called in for some sort of campus development to assist in site selection, to assist in planning the facility and this is tremendously important. I think it was Harold Gores of the Educational Facilities Laboratory who said "Legislation is like a fluid, it picks the shape in its container." This is pretty true, I think, of education. Winston Churchill said a similar thing, "We shape our buildings, and then they shape us." It is amazing how drastically you can interfere with, on the one hand or support on the other, your program, by how you decide to build the buildings. For example, we're in the midst of great in innovations in teaching and learning, and many community colleges are very active in the use of the new media. Any community college planning a new campus today, unless it is thinking in terms of the new media in teaching and learning, is five to ten years behind the times. Yet I go out frequently and see new community colleges being set down on the drawing boards of architects offices and it has the same old kind of planning that would be characteristic of one built ten to twenty years ago. The standard classroom is still a phrase that is being bandied about everywhere. "We need 35 standard classrooms, a physics lab, etc." By the time they are finished they have a campus that is ten years out of date. You really have to put a lot of thought into buildings--about how they can be flexible and how they can respond to this whole new aspect of learning and teaching that will be going on for the next couple of decades.

Sometimes you have to plan a campus before there is a faculty in being. And this is regrettable, but nevertheless frequently this is necessary. This is a situation that really tests your soul--when you are called in as a consultant and the architects have already been retained, the president is there, maybe the dean, the board of trustees is very interested in "our new college" and want to get it going as rapidly as possible. So they expect the consultant to suddenly come up with just exactly what they're going to need in terms of buildings and facilities. The temptation to play God here has to be resisted. To sit down and write a list of specifications for a college that doesn't exist to be used by the yet unselected architects, to plan a campus for students who haven't yet registered, for a faculty that hasn't yet been employed to teach a curriculum for has for the most part been lifted from other college catalogues--this is really cloud nine planning--so far I have been able to resist this and I hope all consultants do. The tradedy is, however, that I know of some instances where boards, the college president or academic dean have sat down and done just this. They have a brand new catalogue that is simply a repetition of catalogues of other places. Some boards of trustees get around this problem by calling in a consulting management firm. This has some good points and some bad points. They can farm the whole operation out to one of these huge and well known national consulting firms. They can bring the new science of systems analysis to bear upon the curriculum planning problem--we have two or three of our new community colleges in Michigan that have gone this route. The big name firm that may have made its name in aerospace or computers or in management and industrial fields talks with the people in the town for a seek or so ans assess the situtation and then they fly back to Boston or San Francisco. Then they'll schedule another group of meetings and interviews. The data is gathered and put into the machines and you have "instant curriculum" in its complete inhuman detail. Ready for the faculty to start dispensing to the students.

I'm not opposed to this approach but I'm not 100% in favor of it either. I think systems planning has something to offer planning, but I would stipulate that critical past methods must take into account instructors, students, and citizens and the constituency of the college. This kind of "instant curriculum" which is brewed in a few short intensive months is usually the result of transistorized effort, is frequently conceived in haste, and often is conceived with a sense that education is too important to be left to the teachers. This is the kind of attitude that some of the systems analysis people bring to town. This is a questionable procedure.

I think that the faculty must be involved with curriculum planning--some of you are faculty and maybe you don't like to be bothered with curriculum planning. But some faculty do want to be bothered, in fact insist upon it. The curriculum--the total offering of the college--ought to be the result of as much planning as can be brought to bear upon the problem.

One of the other ways in which consultants are frequently involved is the improvement of guidance services, and believe me this is something that needs improving in almost every community college that I know of. There's been a lot written about the improvement of guidance services. One of my collegues in Michigan at Michigan State University, Max Raines, did a recent year-long study for the American Association of Junior College, and not belittling all his work and not belittling what has been written, I am merely saying that it has not filtered down into the community colleges of American. We still have a counselor to student ratio of somewhere around 1-500 in most community colleges in the nation, and that just about what it was twenty or thirty years ago. I don't think you can do the job with that amount of staffing. I would recommend at least cutting that in half to one counselor to every 250 full-time students and maybe that isn't sufficient.

One thing that consultants can get across to boards of trustees, of course they have to approve the expenditure of funds for counseling, is that all their counseling time doesn't "generate credit hours". Nonetheless it may be the most productive time expense anywhere on the campus. Career counseling should be fully as important as educational advisement, fully as important as counseling on personal and emotional problems, and yet in the community college, is it? As I look upon the whole counseling-guidance system and get the orientation of the director of guidance and the orientation of the counselors themselves, there seems to be an awe about the whole counseling center of the maladjusted student, the student with personal problems, the student with emotional problems. We do more for the deviant. Surely there are students in the community college who need this type of help and when these students come in with personal and emotional problems we hope they get the kind of help they need and the kind of referral they need. But taking the total mass of the student body, a great majority of the student body that come into the system need to be helped to identify a career, identify a vocation, assist then in their thinking about choosing this or that or the other kind of career or vocation. Giving them occupational information. Letting them know what the discipones of the civen curriculum are. These are the problems that most students face and yet it seems to me that the "tails wags the dog" in many of the community college guidance systems.

We are called in more and more frequently to assist on an impass developed between the administration and faculty over any one of a dozen or more different kinds of problems. As we all know there is a great ferment today on all University and college campuses, including community college campuses. This ferment, of course, has a tremendous amount of thrust with regard to what we might call salaries and working conditions, but not all by any means. The problem of college government, of who makes policy, of teacher load, the problem of promotion and tenure and fringe benefits and who can be fired by whom and why and why somebody got a raise and I didn't. All of these problems are cropping up with i increasing frequency all over the nation. Very frequently these calls come through, the North Central Association because when a college has a blow-up of this kind the NCA usually comes in and requests consultant assistance from the 150-69 of us here in the NCA region.

The kind of work that a consultant does will tend to center around some of the following problems. He may assist in treading out plans for faculty rank and for faculty promotion policy, for merit-pay plan, for fringe benefits plan, for recommendations as to what kind of faculty association. Whether the association of faculty should be local with no national ties or is it should affiliate with the AAUP, the NEA, or the AFT. Secondly he can halp work out policies and procedures for faculty participation. Often times the principle criticism of the faculty is that we don't seem to have any part in anything. The board doesn't listen to use; we don't get to participate. So the consultant will try to work out plans whereby faculty can participate in planning curriculum, in tactics, in day-to-day operation, in student relationships and yet leave policy making for the board of trustees because the board of trustees is charged as the legal body with policy-making. There is no way legally in which a faculty can make policy. When the faculty insists that it is going to make policy, then the college is going to blow apart, because that is when the irresistable forces meet the immovable object. In every state I know the board makes the policy. The faculty may assist in interpreting that policy and working within the policy, but it cannot make policy. We're faced with that impact right now at the University of Michigan and many major universities. The faculty and now even the students are insisting that they are going to make policy. The people of the state of Michigan as represented by the legislature and the board of regents are saying to them, "No you're not." And so we are in the midst of a tremendous battle over this issue. Assignments of this kind, consultants find particularly difficult. The reason they are particularly difficult is that before a consultant is called in the trouble has already boiled over and so you are faced with a situation in which the positions taken by the contending parties are already way out front and a reasonable face-saving withdrawal is not possible. So the consultant has a tremendous job on his hands of trying to suggest alternatives which may be face-saving devices which may enable administration on the one hand or faculty on the other to withdraw to a slightly less combative position; maybe the thing that the consultant can do is to introduce some kind of a third factor or diversionary tactic of some kind over which the two contending parties can then resolve some of their differences on the major issues by contending over the issues presented by the diversionary tactic. This is sometimes something that has to be done.

There was a series of articles in the Junior College Journal ranging over the last two or three years on this problem of faculty-administration relationship and it would be worthwhile reviewing these because we must not let the community college movement in America suffer from battles that will pull the entire life-blood right out of the movement. These battles, these arguments are always able to be solved amicably by a compromise; naturally no faculty member ever gets as much salary as he thinks he is worth, but on the other hand, no board of trustees can go out and legislate rules more than they're legally authorized to do either. And so with men and women of good will who will study the problems seriously and will work out reasonable compromises along these lines, I think that the community college can move ahead without having itself, as a movement, torn apart as some colleges have been in the last year or two as you all know. I have just a parting bit of advice for the administrators in the audience which will assist you in working through such difficulties as I have just described.

**I am quoting this advice from Dr. Herbert Salem's book, Dynamics of Groups at Work: Advice to Administrators. "There are days when problems lay heavily on administrators and I have heard them say, 'I wish I had the answer.'"...**

**As far as any fund raising for the operation of the college, there is no element of that of course in connection with public community colleges. So then, it happens often enough that it's worth thinking about that somebody will actually donate a site. However, I would caution all of you against accepting a site merely because it's donated. It could be the worst site in the county. You'd be a whole lot better off to pay the full market price for the land that will make a good site as compared to accepting free a site which really is not a good one. The more people you get interested in the feasibility study of the community college, the more likely you are to get maybe future gifts of equipment, machine tools, electronic equipment. Giving to public community colleges is not unknown, but the purpose of the feasibility study is not to engender giving.**

**Not many public community colleges actively seek it in terms of actually having a developmental officer like a private college would have and just go out and put the tag on people. Public community colleges do not do that. However, if a public spirited citizen has a gift he wants to make why I don't know of any public community college that would turn him down.**

# THE SYSTEMS APPROACH TO EDUCATIONAL PLANNING*

by

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Two years ago I became involved in one of industry's excursions into the education field and the particular corporation for which I work, whether in good judgment or poor, hired a number of us who were at that time in the educational field to try and work on some of their programs. And it was a big step for someone who had spent all their professional life in education, both in the public schools and at the University, to decide that perhaps a sojourn in the private sector, as it is referred to, could be beneficial to one's professional career. But having nothing else to lose, you might say, at that point and being terribly interested in the changes that were going on and being terribly frustrated by how much one could at the higher education level--I particularly was looking for an avenue where you weren't going to conquer the world, but perhaps you could provide enough of a thrust for other people to begin to be aware of some of the things that could be done that were not being done on any large scale in public education.

So much for why I found myself working for Litton Industries rather than the University of California. But several things have happened to me in the last two years which perhaps are worthy of note. One, I offered a great deal of resistence when I first became involved to what we might call a very intensive analysis and planning effort regardless of what we went into. Traditionally, for whatever reasons, although a great deal of my administrative training has been at the University; I had very little background in what we might call analysis and planning and used to do a great deal of what we call seat-of-the-pants kind of thing, the intituitive judgment. And I found very quickly that when supervising a materials production effort with anywhere from 70-100 people, if one flies by the seat of his pants one may be out of a job. And so very quickly I became convinced that there were tools which one could use if you want to retain the bit of green stuff that comes in every several weeks. And two, to perhaps do a more effective job and three, if not more effective to at least know what you've done.

Many of you who aren't familiar with this kind of way of putting out your thoughts, I'm sure will resist it--I certainly have and I still today look at it no more than as a tool. And I think this is one of the things that we tend to get ourselves cross ways of--we look at the techniques which people may use that seem to be confining, that seem to be set in concrete; if you see something on a sheet of paper it seems to be a fact and that is not the case. The reason for reducing things to paper and reducing things to strategies is for purposes of modification. Everything that we do we look at as an approximation--an approximation of what we're going to do and these stay dependent on what we find out. It probably will change;in fact there is a good probability that it will change. Well all this merely gives you an idea of my own personal involvemnt in this kind of thing. Some of the problems which I've encountered in attempting to relate more effectively to what some people call educational engineering, other people--educational technology, whatever you want.

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Let me give you just a brief description, perhaps in a sentence, of what we would attempt to do. We would attempt to put people and resources, and by resources I mean all the various kinds of media that are presently available, and the hardware as we refer to everything from the machines over here to the learner, into an environment which equips the learner in acquiring whatever piece of information and knowledge that you put into the program. And in doing this a detailed analysis of what it takes to do that. That's a very general statement and said perhaps in another way, educational technology is the application of principles, methods of procedure, the design of valid, irrepoachable learning systems. What it is is an attempt to apply things that have been learned in other fields to the learning process.

There are about ten topics which we should cover in one form or another. Educational goals, the analysis of these goals, the specification of anticipated or expected learning behaviors on the parts of students the relationship on the part of what we call terminal behavioral objectives, in other words what it is that you want the student to be able to do once he finishes a unit or course of instruction to the prerequisites, to what he must know before he starts that course and how you find that out, population characteristics. Some discussion on the construction of criterion tests. Once you've made up a series of objectives how in fact do you determine whether or not the learner has achieved these objectives. and we call these or refer to these as criterion tests. The selection of media to best attempt to accomplish these goals and then the actual development of material considerations in curriculum development and, of course, the role of teachers.

You might be interested in why to some extent the industrial sector is interested in education. There's a quotation, a comment reported in Automation and Technology in Education, which is the report by the joint economic committee of the U. S. government where a witness testifies that "...the American edonomy was built around the railroads in the last half of the 19th century, around the automobile in the first two periods of this century, and it will be built around education the balance of this century." From the private sector point of view there is more and more concern about the occuring of markets, as this is traditionally referred to. And more concern about the development of service related markets. And education is abviously one which permeates every segment of the economy, including professional education, adult and basic education as it relates to literacy, public school education, and certainly all levels of education. And all these require servicing in some form or another, so I think you can readily see the interest here.

The word system is bantered about today with knowledgeable facility and simplicity. Most everyone has a definition if only the result of a quick trip to a dictionary. Systems concepts vary with complexity as stated by Wyner in the Human Use of Human Beings, or Hall in the Methodology for Systems Engineering or Silver in the Systems Analysis and Synthesis in Training and Education. Are any of you familiar with cybernetics? Then a lot of you will have a good base for understanding the approach here. What we have attempted to do is take some cybernetics--the systems concepts and apply these to communication processes in the learning environment. The communication theory of cybernetics appear to provide an appropriate conceptual framework for systems development. To the systems engineer, technocrat, or cybernatian I readily confess that this is a crude attempt of a professed educator to adapt the concepts and tools of information theory and systems engineering to the instructional and learning environment. But crude though the attempt may be, it seems clear that greater precision in dealing with the learning environment is necessary in the movement toward the scientific approach to education. To assist effectively in learning requires a large degree of understanding and controlling the complex values impinging upon the learner. Obviously there are very real limitations in our present techniques, and will continue to be limitation in any proposed procedures and techniques.

Before venturing further into what is a system and systems approach, it may be appropriate to establish some common ground by providing a conception of an ideal instructional institution. This description is taken from Silberman and Carter, A Systems Approach to Technology in the Schools. This is a Santa Monica corporation that is doing a great deal with computer assisted instruction out in the Santa Monica area. "An ideal school often takes the following form. The objectives of the school are clearly specified and the school system is evaluated and modified to maximize the extent to which these objectives are achieved. The school staff has an experimental orientation and modify materials and procedures to successfully approximate the objectives. A highly competent research staff consisting of a variety of contra-experts and behavioral scientists work together to produce a well-integrated curriculum and fulfill the objectives. They provide a steady pipe-line of well tested materials and procedures for use by the teaching staff. Individualized instruction based on new developments and classroom technology is used to allow all the students the oppotunity to learn at a pace fitted to their individual abilities."

"Management problems are solved with the use of computers allowing ready access to student records, sufficient flexible scheduling, and optimal allocation of resources."

This description does not sound to be either unreasonable or startling. Silberman and Carter continue by describing the present educational system for purposes of comparison. In this they are essentially looking at the secondary school as it exists today rather than the junior college. In contrast it sometimes appeared that there was a large gap between the ideal school and actual school practice. "Consider the school today--first the problem is objectives, although various curriculum study groups such as the school mathematics study group have been doing a fine job of clarifying objectives in their area. And all these efforts are only a part of the total curriculum. In the absence of priorities goals are established by legislative expedient or pressure of the moment. Long range planning on the basis of socio-economic trends is virtually non-existent in public education. Teacher training has not changed fast enough to meet the changing educational requirements. It is not enough to indoctrinate teachers in the latest educational theory. The teacher must become experimentally oriented with a focus on inventive process. Conventional teacher training produces an acceptance of practices based on authority and does not develop an experimental attitude. Prospective teachers are not taught to take pride in using evaluation instructional tools that are effective in producing desired student behavior. Not only the teacher bu the educational system does not favor experiments and objective evaluation. Most schools are still organized in a lock step system which does not permit individualized instruction. The increasing departmentalization and specialization of the curriculum renders the system even more inflexible."

Hopefully we are moving from this description, which appears to be the case today, to something approaching the ideal. There are two essentially different ways of moving towards an instructional system. One, the traditional approach, takes as given the effectiveness of some group of educational processes and methods. The second, now in terms of the systems approach, makes no such assumption but rather takes as given some group of educational outcomes and then demands that the designers identify those processes which will produce the desired outcome. The first approach migh be termed process oriented, the second could be called outcome oriented. It is doubtful that the systems approach has yet been demonstrated to be substantially more effective in education than the traditional approach. Although the systems design philosophy has proved very fruitful in designing other kinds of systems.

Before proceeding any further it would seem necesssary to say what is meant by system. Initially we can define a system broadly and crudely as an entity, conceptual or physical which consists interdependent parts. In discussing education, we are dealing with a conceptual system and concerned with behavior. Bill Vernon, systems analyst in sysnthesis and training in education, has defined a system as "a structure or organization of an orderly whole clearly showing the interrelation of the parts to each other and to the whole itself."

What has been described above whould not be confused with a systems approach. The systems approach is a tool for solving complex problems. Specifically, it is a tool employed in the formulation of strategy for solving complex problems. It is a methodology which has proved itself in many areas, but yet has been notably absent in the field of education, where the need for solution to critical problems has compelling urgency. Such educational problems as those revolving around the increasing numbers of students, the needs for upgrading professional skills and capability, retraining through continuing education, and the demand for a higher level of education based on a long term strategy based on a rigorous and analytical approach. Again let me repeat, it is in the formulation of these strategies that the systems approach can provide a significant contribution. The approach is goal oriented, it demands an analysis of the total job to be performed and it specifies a logical progression of steps toward accomplishing that job. It is an objective, well-documented technique of problem solving with certain established ground rules. These rules involve the application of definable principles of analysis to achieve the objectives of the educational systems design.

The procedural steps are briefly as follows: 1. Specific instructional goals of the system are stated in terms of desire to perform it. The operational limits are defined. 2. The goals are broken down into an organization of tasks. These tasks are related to each other and to the stated goal of the entire system. System functions are categorized into three divisions--Classification of growth systems, system functions, classification of sub-functions representing semi-independent operations performed within the grosssystem function. Detailed classifications of specific functions to be performed within such functions. 3. Identification of measurable performance units. We refer to these as terminal performance specifications. Terminal in the sense that this is what you anticipate that the student will be able to do at the end of this particular unit of instruction. 4. All functions critical to systems performance are specified and in this process appropriate weightings are assigned. Obviously everything isn't of equal importance. 5. Design requirements are specified. This includes allocation of tasks to people and functions to be performed. And the performance limit and operation and design from experience. That means I guess, what I've done in getting myself immersed in this thing is, I've taken on the vocabulary of the people with which I work--this I found was the easiest way to communicate, so I learned their vocabulary and I find that I often when I talk to educators we are just not communicating, but essentially that last statement means that people and things and materials have to be at the right place at the right time. At the same time there are very real limitations on what you can do so that the attempt here is that statement is to define these limitations.- For instance, not realise at the end of today that we can't possibly cover 50% of the material and do something about it. Many times when we are teaching a course and we can't cover all of the material we get to the end of the semester and we say, "Well, sorry about that--we'll do that next semester." So the attempt here is not only to teach what we like to teach, but attempt to realize what we can effectively do within the constraints and limits that we have in the particular instructional environment. A lot of people refer to this as the intuitive ability to organize oneself. What we're attempting to do is to say that we can be much more effective. I don't like to use the word efficiency--it is important but in terms of weighting it is not that important. It is the efficacy of the design in terms of compatable interaction between design units. Is it realistic? Will it work? Does it make sense? In other words some real judgments on the part of people who are putting this together. The designing criteria are specified. How are you going to measure it? What are the things you are going to build against? Design trade-off is effective--a process of compromise between design relevancy and design practicality, achieved without sacrificing any of the specified tasks in form of total system. You can't do everything--you have to begin to make some decisions about what it is that is more important than something else--that's a trade-off. Total system design is accomplished. Terminal achievement satisfying mission objectives, within a specified performance limit, active strength.

You end up with a unit of instruction. This unit of instruction relates overall objectives and goals of both the course and the institution. Within the time that is allowable, the learner has the best chance of obtaining these objectives and demonstrating that he has obtained them.

For purposes of this discussion, the Educational Institute has conceptualized and sub-divided four major parts. One of the things that became apparent to me upon becoming involved in the private sector was that there were things called managers; traditionally in public schools we have administrators--people who administrate things. In the private sector they look at people as managers. Managers are very professional people and very competent people who are trained to manage. So we put the management sub-system which is directly responsible for all the policies that guide each of these other sub-systems. This is the central control of all activity. Now control in many areas is a dirty word, and I have to refer back to cybernetics because you get a much better concept from there and that is that control facilitates and it is not something that is looked upon as manipulating people for your ends. It really gets confused, but what we are talking about is the guiding, the direction, the responsibility, the authority for a very large enterprise and that takes a certain amount of control, coordination, integration and all of this has to be centered somewhere.

Below you have the support--administrative areas and many times they are directly symetric to what we call the administration-management group, but since there is equal responsibility for coordinating in these areas it doesn't make any difference who you have them on the chart. Management has different kinds of responsibilities for everyone of the sub-systems. The Monitoring and evaluation sub-system--this is one of the really important functions that has to be performed in individualized programs as it answers the questions about where the people really are on their individual programs. How do you evaluate and modify the program in terms of their needs and for evaluating what's happening? Now a certain amount of monitoring is built into each sub-system. Everyone knows what is required in terms of the objectives to be accomplished and they have a role in determining those objectives and in determining the criteria against which it is measured. But somewhere this has to be collected together. The people who are responsible for the situation have to have a way of knowing who is in trouble, and how much trouble. In a system like this there is really no excuse for arriving at three-quarters of the year and being out of money; no excuse for letting a student flunk because you should be able to identify that student and the trouble that he is having very quickly and he should be directed to a counselor or a tutor or whatever. This monitoring-evaluation path provides for a central repository where all this information when it comes in from the various sub-systems can gather. For example, in a file each child would have a folder like today and depending where he is a flag placed on his folder. After a while a lot of flags are built up and you can see where something is wrong and do something about it.

# AN INSTRUCTIONAL SYSTEM*

(* Adapted from a memorandum prepared by S.M. Corey and Phil Lange for TI4810, Principles and Practices in Programmed Instruction, Teachers College, Columbia University.)

1. The word SYSTEM is used to designate a collection of people, equipment, apparatus, machines, procedures, "software," etc., that has been assembled TO PERFORM A GIVEN FUNCTION OR TASK.

2. A SYSTEM can be very simple or very complex depending primarily upon the number and complexity of the decisions required for the system to perform its functions. A relatively simple SYSTEM established to get letters or manuscripts typed might consist only of a typewriter, paper, and a typist. A much more complicated SYSTEM is represented by a modern hospital. A hospital includes various kinds of people playing various roles (doctors, nurses, laboratory technicians, custodians, etc.) as well as equipment, apparatus, furniture, drugs, and communication arrangements ALL SELECTED AND ARRANGED AND OPERATING SO AS TO IMPROVE THE HEALTH OF THOSE PERSONS WHO ENTER THE SYSTEM TO BE SERVED BY IT.

3. An infantry machine gun company is another kind of system with differen personnel, machinery, equipment, structure, method of operating, and pu pose. Whatever is included in the infantry machine gun "system"--men, equipment, procedures--is there in the belief that it will facilitate the system's function--to destroy the enemy.

4. A particular school classroom is also an illustration of a SYSTEM--an INSTRUCTIONAL SYSTEM. This SYSTEM includes people (the teacher), equipment (blackboards, chalk, pencils, film projectors) and other materials (books, maps, charts, models) all of which have been selected or constructed or assembled in the belief that they will constitute an effective environment for learning.

5. Pupils enter the CLASSROOM SYSTEM and it operates on them or processes them in such a way as to cause them to acquire various kinds of desirable behavior. As has been said, providing instruction is the primary function of the school room system. It also is expected to serve important custodial functions, as most parents would insist.

6. As may have been implied above, most systems are actually sub-systems. The infantry machine gun company is usually a sub-system of a battalion which is itself a sub-system of a regiment. A classroom system is, of course, a sub-system of a school building system which is in turn a sub-system in a total school system.

7. Some of the characteristics of a SYSTEM as the word is here being used are:

   a. The system exists to perform a function, get a job done.

   b. It has physical boundaries and identity. You can locate it in space, perceive it.

c. A system typically consists of *interdependent* men (or women) and materials--often a great variety of both--*operating in functional relationships* to one another.

d. Most systems include arrangements for "*feedback*" into the system of the effects of its operations, and "*feedback*" *adjustments* to MAINTAIN PRODUCTION STANDARDS. This serves to guide and redirect if necessary the system's operations. For example, the typist can see what he has typed and this enables him to correct his mistakes if he has made any. Tests given by the teacher provide "feedback" and make it possible to improve the operations of the classroom system.

e. In complex systems the relationships among the various parts are maintained by *an intercommunication system*. This communication network is itself a sub-system.

f. In most instances a system can at least be partially described by referring to INPUT, PROCESSING, AND OUTPUT. Pupils are part of the INPUTS for a school room system. The system's PROCESSING is in part the stimulation of these pupils by the people and materials that constitute the learning environment of the system. This stimulation (environmental control) has as its intended consequence teaching the pupils certain desirable behaviors. The pupils are in due course discharged by the system (OUTPUTS) as they have acquired these behaviors. The PROCESSING of this type of system is called INSTRUCTION. Some systems MANUFACTURE.

g. Most systems can have their *efficiency* assessed by studying the actual cost in time, materials, and labor to achieve a designated unit of *output*. This kind of assessment is not made very often, however, in the case of an instructional system.

8. In most systems the INPUT is screened in some way to increase the assurance that what gets into the system to be processed by it is what the system was developed to process. Water, for example, should not be part of the INPUT of an air cooled internal combustion engine system. Similarly, pupils who cannot read should not enter certain instructional sub-systems.

9. The screening for an instructional system is accomplished to determine whether or not those entering the system (a) have under their control the required ENTERING BEHAVIORS 9course prerequisites, for example, in the college program) and (b) possess the needed or desired physical or capability characteristics.

10. Departure from an INSTRUCTION SYSTEM or sub-system is determined eventually by the learner's reaction to some form of examination or CRITERION TEST. This test has been developed to determine whether or not the instructional system has done what it was designed to do, namely, bring certain behaviors under the learner's control so that he can omit them as responses to designated stimuli.

11. Within an operating INSTRUCTIONAL SYSTEM the persons to be processed are the pupils who are to be instructed. whatever other people, materials, and processes are provided as the learning environment are there either (a) as stimuli to be responded to by the pupils in order that they will learn, will acquire the designated behaviors, or (b) in support of these stimuli.

## DEVELOPING AN INSTRUCTIONAL SYSTEM*

(* Adapted from a memorandum prepared by S.M. Corey and Phil Lange for TI4810, Principles and Practices in Programmed Instruction, Teachers College, Columbia University.)

### Instruction--a special kind of teaching.

1. The word INSTRUCTION is used to designate THE PROCESS WHEREBY ONE OR MORE PERSONS (INSTRUCTORS) INTENTIONALLY ELICIT, OR PREPARE MATERIALS THAT ELICIT, SPECIFIED APPROPRIATE BEHAVIORS IN RESPONSE TO SPECIFIED SITUATIONS UNDER CONDITIONS THAT REINFORCE THE BEHAVIORS.

2. Given this definition, the simplest instance of instruction, an instructional MODULE so to speak, would seem to have these minimal characteristics:

   a. The instructor makes clear in any one or more of a variety of ways the specific behavior or response to be learned and the specific situation to which the response is appropriate.

   b. The student is provided with an opportunity to demonstrate that he has this behavior under his control--that he can omit it in the presence of or in response to the appropriate situation.

   c. If the student responds correctly the response is reinforced. In most school situations this means he is told that his "answer" is correct.

3. With the promise that much instruction can become more precisely describable and replicable, the current instructional technology requires:

   That the behaviors (objectives) to be taught be explicitly stated in behavioral terms;
   That criterion tests be developed to determine whether or not these behaviors have resulted from the instruction;
   That these behaviors be continuously elicited and reinforced by stimuli (learning environments) that will do so most effectively;
   That the applications of learning theory be consistent and meticulous; and
   That experimentation be an integral part of the Instructional Systems.

4. In general any SYSTEM has these characteristics: A SYSTEM HAS...

...a specific function to perform--often this results in a product, an OUTPUT;

...physical boundaries and identities (can be located, perceived);

...materials and men operating in functional and reproducible relationships to one another;

...arrangements for "feedback" and provision for "feedback" admustments to maintain operation or production standards;

...an intercommunication system (itself a sub-system) to maintain operational balance of INPUTS, PROCESS, OUTPUTS within the system;

...measurement, standards, and efficiency considerations.

5. Developing a Programmed Instructional System requires that the instructor or the several persons responsible for the instruction, do the following:

a. Describe (i) the ultimate behaviors intended to be the outcomes of instruction provided by the System as well as (ii) the situations or stimuli that should elicit these behaviors.

An illustration of a symbolic terminal behavior for a very limited instructional system (program) might be: "Says 'Christopher Columbut' in response to the auditory stimulus: 'What person subsidized by Spain is generally believed to have discovered America?'" An illustration of a non-symbolic or sensori-motor terminal behavior is: "Adjusts the lathe to a tolerance of .008 inch when directed to do so by his supervisor."

Three points may need emphasis here in connection with the statement of the terminal behaviors that define the purpose of instruction. First, the stimuli or situations to which these terminal behaviors are judged to be appropriate responses must also be specified. To say "Christopher Columbus," for example, in response to the stimulus "Whom do Americans often call the father of their country?" would not be acceptable. The second point needing emphasis is that these terminal behaviors must be so stated and described as to make it possible to get evidence of their existence (see item "c" below). In other words, whatever it is that the instruction is intended to accomplish must be measurable. The final point needing emphasis in regard to stating terminal behaviors is that there must be some indication of the minimum quality of response that is acceptable. For example, this statement of terminal behavior for an instructional program or system having to do with shorthand is not adequate:

> Translates oral speech into shorthand symbols and subsequently reconstructs the speech by translating the symbols orally.

This statement of terminal behavior is better.

> Translates thirty minutes of non-technical speech delivered from manuscript at an average rate of 100 words per minute

into shorthand symbols and subsequently reconstructs the speech without error so that it conforms to the original manuscript.

b. Identify and describe the characteristics of the population to be instructed by the system.

An illustration of a behavior characteristic or requisite of the population to be instructed might be: "Has mastered the multiplication tables up through 15." This concept of entering behavior is different in an important respect from the quite common academic institution concept of "course prerequisites." The latter are often prerequisites only because someone says they are. Actually they may bear little if any relationship to the behaviors taught in the course for which they are designated as prerequisite in the "catalogue." The conception of ENTERING BEHAVIOR, as we are using it, represents those components or aspects of the terminal behaviors that have resulted from a disciplined behavioral analysis but will not be taught in the system. This aspect of the development of an instructional program or system, describing the population for which the system has been designed, is, of course, intimately related to the formulation of terminal behaviors.

c. Construct a CRITERION TEST to make it possible to find out if the desired terminal behavior can be omitted at the specified level of quality and in response to the appropriate situations or stimuli.

The response to this CRITERION TEST determines whether or not the person instructed is ready to leave the instructional system or sub-system. The construction of a good criterion test may be a major task. First and of extreme importance, it must be valid. By valid is meant that the behavior required to cope with the test successfully must be the behavior the program or system was designed to teach. A second requirement of a good criterion test is that the number of responses and situations sampled by the test must be sufficient.

In the construction of an instructional system it is helpful to work on the "terminal behaviors" and the "criterion test" at the same time. The need to devise a method of getting evidence that the behavior presumably taught will actually be omitted in response to given situations often reduces the tendency to state terminals vaguely or to have unrealistic expectations in regard to them.

d. Analyze the desired "terminal behavior" into its elements or components.

This is often a complicated and demanding task and one to which insufficient attention is paid in much instructional planning or programming. Various ones of the components resulting from a terminal behavior analysis will be assumed to be known and designated as ENTERING BEHAVIORS. The remaining behaviors may either

(a) be sequenced and taught separately and eventually combined or (b) be reinforced in a shaping process (approximation learning) or (c) be controlled through effective directions (manualized). This behavioral analysis has as its eventual purpose the identification of the modular responses and situations which will constitute the major part of the instructional system being designed.

e. Construct ENTERING TESTS to determine whether or not the prerequisite entering behaviors and/or conditions (normal eyesight, etc.) obtain.

This is done so that only the learners for whom the system is designed will enter it. Failure of an instructional system to do what it was designed to do often results because the entering characteristics and behaviors assumed were not in fact present. The construction of these ENTERING or screening tests involves the same validity and sampling problems that were noted under "c" above in relation to the CRITERION TEST.

f. Create an environment for the learner that will get the desired behaviors omitted and reinforced as responses to appropriate situations.

This step represents the central task of construction an institutional system or program. This would seem inevitably to be the case if instruction is defined as the process that brings specified behavior under the learner's control so that he can respond appropriately to given stimuli or situations. The reinforcement of the desired response when omitted is to increase the likelihood of its being omitted subsequently in response to the same or to similar situations or stimuli. Each of the specific instructional MODULES in a programmed instructional system is generally called a FRAME. Depending somewhat on the terminal behaviors the instructional system is designed to teach, these instructional MODULES or FRAMES will be constructed to achieve one or more of each of the following general purposes:

i. Get the desired behavior under the learner's control so that it can be omitted on request.

ii. Cause the learner to discriminate the stimulus or stimuli considered appropriate for the response from inappropriate stimuli or situations (discrimination learning).

iii. Get the desired behavior omitted and reinforced in the presence of or in response to the appropriate stimuli (association learning).

As was said in "i" above, in some instances of instruction (response learning) instructional situations must be designed that will get the desired behavior omitted before any attention is paid to trying to get it attached, so to speak, to an appropriate stimulus. In most instances of conceptual or verbal learning the various behavioral elements that add up to the terminal behaviors have already been learned. This means that the instructional task is to get these elements properly sequenced and attached to (associated with) appropriate stimuli.

iv. Arrange for an appropriate reinforcement schedule so that the desired behaviors once under the learner's control will continue to be elicited by the appropriate stimuli for as long as is deemed desirable.

This aspect of instruction has received all too little direct attention. "Reviewing" in the course of instruction is common, but when the desired terminal behavior once appears to be under the control of the learner, and by this is meant that he can respond appropriately, "extinction" or forgetting are either completely overlooked or it is assumed that they will be dealt with in the ordinary course of events. One of the expensive and pervasive sources of waste in formal education results from the almost complete lack of attention to post instructional reinforcement. The learner is discharged from the system or sub-system when there is evidence that the terminal behavior has just been learned. Nothing is done to increase the likelihood that the learner's control of his responses will continue.

6. Aspects of the development of an Instructional System "i" through "iv" above are always subject to modification in light of their consequences. These consequences are observed in two different ways. First, as the instructional situations or frames are being developed they are continuously tested clinically (DEVELOPMENTAL TESTING) by having two or three learners respond to them in order to determine whether or not they are effective. Secondly, when the instructional program or system is completed it is FIELD TESTED with the populations and under the circumstances with which the program was designed to deal. Following the field testing, the system is again modified and improved if this is called for.

7. While there is some operational logic to the sequence of the activities described above that seem to be necessary for the development of a programmed instructional system, the sequence is not to be viewed as rigid and there is considerable interaction among aspects of the total task. Work on the criterion test, for example, often forces a reformulation of the terminal objectives. Similarly, identifying "entering behaviors" often requires a reconstruction of other parts of the system. In many instances of the construction of an instructional system some development of MODULAR instructional situations (frames) may come quite early --even before any final formulation of terminal behaviors. There may then be several cycles in which terminal behaviors are refined and reanalyzed, entering behaviors changed, and the criterion test modified as production of the instructional system proceeds.

8. We want to repeat the substance of item 6 above. The various aspects of instructional system development "i" through "iv" are always subject to modification in view of their consequences. In other words, whatever is done to construct the system is in the nature of a series of hypotheses to be confirmed or rejected by getting evidence of their consequences when tested in action against their results. Instruction, in other words, is being viewed as a continuous series of experiments.

9. The various tasks that are necessary for the development of an INSTRUCTIONAL SYSTEM can be accomplished with varying degrees of care, system and objectivity. The point to be emphasized is:

> TO THE DEGREE THE DEVELOPMENT OF THE SYSTEM REPRESENTS CAREFUL, DISCIPLINED, AND OBJECTIVE PLANNING, ACTION, AND EVALUATION THE SYSTEM'S SPECIFIED FUNCTION IS MORE APT TO BE ACHIEVED.

Oakland Community College is dedicated to the application of the tutorial method of instruction to achieve individual student learning and performance. The administration, faculty and all components of the educational facility will be directed toward the production of measurable and predictable student achievement.

The "systems" approach to instruction employs a rigorous analysis of curriculum and a systematic structuring of this material from the learner's point of view. The result is a logical, functional, step-by step path whereby the learner proceeds from his personal starting level through accomplishment of previously set performance objectives.

## INSTRUCTIONAL SYSTEMS APPROACH

The "instructional systems" approach uses many different techniques to accomplish its objectives. The system is nothing more than a collection of the various elements making it up and a design for accomplishing a set of objectives. By organizing and channeling available resources and techniques to accomplish a common purpose, the "systems approach" becomes a powerful management tool.

Once agreement upon a set of objectives is reached, the procedures necessary to accomplish the objectives can be deliberately prescribed. If the approach is inadequate, the system provides for review, revision and modification to compensate for performance which is below the minimum acceptable level.

While it is not a simple task to describe and agree in advance on the terminal performance specifications, this initial step is necessary if effective performance of the system is to be achieved. Terminal performance specifications are detailed descriptions of student performance which represent the specific outcome expected at the end of a course. Terminal performance specifications are prepared in advance so that the plan or intent of the course is clear. An approval by the administration is obtained after the course is planned and before it is offered.

When all terminal performance specifications have been developed, they can be checked against the requirements set up by the state, or district, or other agency having an interest. If there have been omissions or deviations from the stated requirements, these faults can be corrected before the course is offered.

Although there are many philosophies of education, the adaption of the "systems approach" requires that all performance specifications be detailed and stated in terms of student performance when he has completed the course.

Since burden of proof always rests with the student, rather specific descriptions of what he must do must be provided. If a young woman aspires to a career as a secretary, she must be told in advance how she can demonstrate her competence in order to receive a grade. If the terminal performance specification requires her to type from strange copy at a speed of 60 words per minute, she must be given a chance to demonatrate her ability to do so under acceptable testing conditions. Is one short test enough? Should she turn in several performances each of which is separately timed? Should the average score on several tests be used as her performance measure or should she be required to achieve terminal performance three consecutive times with no deviation?

All such specific questions must be answered in advance. Measures of student performance must be made in a way consistent with the most recent information about testing procedures and human performance data. Matching the criterion performance to the terminal performance specifications requires careful analysis. Criterion performance is the behavior sample taken as evidence that the student has accomplished what is expected. If we impose typing speed as one of the terminal performance specifications, then the behavior to be measured must be typing. A pencil and paper test is of no value in measuring typing speed.

If the course is concerned with other kinds of performance, then other measures must be taken. If we want the student to write an acceptable defense of the South's position prior to the Civil War, then we must identify those elements which constitute an "acceptable defense". If the slavery controversy should be described, to what extent should legislation be listed and in what detail must it be analyzed?

Many courses of instruction deal with subject matter which does not lend itself to absolute performance measures. If we asked a student to present orally a description of Hamlet's relationship to Ophelia, we can evaluate two separate performance specifications:

a) how well the student underatood Hamlet and
b) how well he describes literature orally.

Only if we have specified in advance what the expected answers should contain and what speaking skills should be exhibited can we effectively determine the quality of the student performance. If any single statement could summarize the approach, it might be: "Tell the student what is expected of him, show him where he can obtain the necessary information and equipment, provide an atmosphere of assistance and encouragement, then require him to demonstrate criterion performance consistent with the instruction he has received."

# SUMMARY

The 20th annual Iowa Community Junior College Workshop took as its theme, "The Educational Program: Coordination and Development." The topic seemed to be of as much concern to institutions that are in the initial stages of developing educational programs as to institutions of long standing that are faced with making their offerings fit their stated philosophy.

The three major workshop consultants brought a wealth of experience and a complimentary set of concepts to the session. Professor Norman C. Harris, nationally known author and consultant in the area of new programs for two-year colleges brought out the concept of the community college being a unique institution, requiring a distinctive program. The content of the occupational programs was the center of discussion in many sessions with the amount and type of general education to be required the critical issue.

A core program was suggested by Professor Harris as a possible approach to providing a common experience for all students entering occupational programs. This concept along with a "spin-off" technique would provide for economy in instruction as well as continued opportunity for students who found their abilities and interests allowed them to continue toward higher level preparation.

Discussion groups in the areas of engineering and industrial education, business education, health education, and public service education were led respectively by Dr. Ellis, Iowa State University, Dr. Reece, Northern Iowa University, Miss Kerr, University of Iowa, and Mr. Holcomb, University of Iowa. The implications of Professor Harris' statements in his keynote address were discussed in each group. A panel composed of Dr. Ellis, Dean Beem, North Iowa Community College, Dean Eddings, Area Ten Community College, and Professor Harris reacted to the core concepts presented earlier, and during this time it was obvious that major differences of view points existed on this topic.

A tour of the University of Iowa's "core program" provided workshop participants with a kaleidescopic view of a program which has grown out of a highly respected and well publicized general education experiment of the 1920's under Earl McGrath, then dean of the graduate college at the University of Iowa. Dr. Samuel Becker, chairman of the faculty committee studying possible revisions of the University core program, provided some food for thought concerning the place of general education in the educational program of the students, and faculty members R. L. Cuany, natural science; J. R. Wilmeth, social science; George Forell, religion; Richard Lloyd-Jones, literature; and Cleo Martin, rhetoric, described the operation of the program in their respective fields.

The trip to Muscatine resulted in a pleasant social experience aboard the Kent Feed Company boat. A stimulating and thought provoking session by the faculty of the Eastern Iowa Community College Feed and Fertilizer Marketing Technology Program followed the riverboat trip. The implementation of the General Education aspects of the Feed and Fertilizer Marketing Technology Program became a point of discussion at many future workshop sessions and also during informal group gathering.

Dr. Lewis Fibel, occupational specialist from the American Association of Junior Colleges, explained the part played by the AAJC, Federal Agencies, State Departments of Public Instruction, and Accrediting Agencies in the development of Community College programs. Professor Harris made his final appearance discussing the role of the consultant and the use of surveys in the development of educational programs in the two-year institutions. The instruments used by survey teams with which Professor Harris had worked were used as focal points in his presentation. The need for and the value of the consultant were explained and well documented by Professor Harris.

Dr. Robert Baker, Director of the Education Systems Division, Litton Systems, Inc., presented a modern approach to the topic, how to best meet the needs of the student and how to evaluate the results of the process. He described the application of up-to-date educational technology to the learning process. One particularly interesting technique used at a new two-year college in Michigan is the extensive use of a computer to process the vast majority of the school system's information. Not only were the more routine items on the school's computer (payroll and bookkeeping) but a large amount of data about the performance of each student was constantly updated on a real-time basis. The administrative staff is able to use this data to spot those students that may need additional guidance.

The cybernetic approach to systems engineering aims to arrive at the most appropriate combination of hardware and other factors in order to provide for the most conducive environment for the learner. The technique of systems analysis lends an organized method of identifying the multifarious and complex variables that affect the learner. The fact that the systems technique often is associated with electronic data processing equipment should not detract from its successful application to nearly all phases of the school program.

One of the first jobs of any school, according to Dr. Baker, is to define its objectives. The objectives of the community college must always be in terms of the results expected from application of instruction to the students. One handicap to a number of institutions is that they are prone to adopt the traditional approach to education--that being a "process" oriented educational system. In this type of school the normal routine is to concentrate on the tried and true methods of instruction that have been employed in the past with the use of traditional hours, methods, and facilities. By fitting a variety of students into the process, the school then views the results (if the results are evaluated at all) and then goes on to repeat the whole operation again.

In the ideal school the objectives are clearly defined in an "outcome" oriented fashion. It is the outcome from a unit of instruction that is significant--not the process of the instruction itself. The staff must clarify what the outcome is to be before any really meaningful program can be organized. This does not involve any modern gadgetry at all. The next step is to design the environment that will best suit the learning process. The environment includes the building, books, teachers, and other necessary audio-visual instructional materials. An interesting example of this type of program was mentioned by Dr. Baker. He told of a community college in Michigan that had managed to teach a large student body with very limited physical plant. The method involved extensive use of study carrels and tape recordings. The student was able to accomplish much of the class assignment at his own pace and on his own initiative. One advantage cited for this type of teaching is that it reduced the amount of sheer repetitive type of instruction and frees the teacher for more concentrated efforts to perfect the units of instruction and to have more time to provide individual counsel to those students that require it. This system does place a heavier burden of responsibility upon the student to develop his own initiative in accomplishing each assignment. In schools where innate student initiative might be low, this type of system could pose some serious problems. A large students guidance and counseling program is necessary to make this system operate effectively.*

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* Summary by Richard Gaulke.